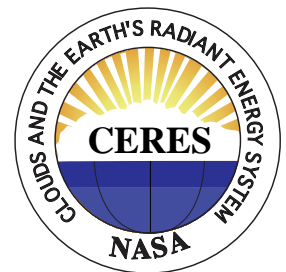# Clouds and the Earth's Radiant Energy System (CERES) Data Management System

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Version #
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Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

Document Title

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Document Revision Record

The Document Revision Record (See Table 0-1) contains information pertaining to approved document changes. The table lists the date the change is issued, the Release Number, the Document Configuration Change Request (DCCR) number, a short description of the revision, and the revised sections. The document authors are listed on the cover. The Head of the CERES Data Management Team approves or disapproves the requested changes based on recommendations of the Configuration Management Board.

Table 0-1. Document Revision Record

Issue Date	Release Number	DCCR[a] Number	Description of Revision	Section Affected
mm/yy	R1.1	xxxx	Initial draft document release for team review	All

a. Document Configuration Change Request Number

Preface (Operator's Guide)

The Clouds and the Earth's Radiant Energy System (CERES) Data Management System supports the data processing needs of the CERES Science Team research to increase understanding of the Earth's climate and radiant environment. The CERES Data Management Team works with the CERES Science Team to develop the software necessary to support the science algorithms. This software, being developed to operate at the Langley Distributed Active Archive Center (DAAC), produces an extensive set of science data products.

The Data Management System consists of 12 subsystems; each subsystem represents one or more stand-alone executable programs. Each subsystem executes when all of its required input data sets are available and produces one or more archival science products.

This Operator's Manual is written for the data processing operations staff at the Langley DAAC by the Data Management Team responsible for this Subsystem. Each volume describes all Product Generation Executables for a particular subsystem and contains the Runtime Parameters, Production Request Parameters, the required inputs, the steps used to execute, and the expected outputs for each executable included within this Subsystem. In addition, all subsystem error messages and subsequent actions required by the DAAC operations staff are included.

{Optional section to list cudos to preparers. Example below.}

Acknowledgment is given to Yvonne M. Seaman, Waldena Banks, and Elizabeth Filer of Science Applications International Corporation for their support in preparing this document.

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1.0 Introduction

The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS) program. The CERES instrument provides radiometric measurements of the Earth's atmosphere from three broadband channels: a shortwave channel (0.3 - 5 μm), a total channel (0.3 - 200 μm), and an infrared window channel (8 - 12 μm). The CERES instruments are improved models of the Earth Radiation Budget Experiment (ERBE) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as ERBS, was successfully developed in ERBE to reduce time sampling errors. CERES continues that strategy by flying instruments on the polar orbiting EOS platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation and to improve the consistency between the cloud parameters and the radiation fields, CERES includes cloud imager data and other atmospheric parameters. The TRMM satellite carries one CERES instrument while the EOS satellites carry two CERES instruments, one operating in a fixed azimuth plane scanning mode (FAPS) for continuous Earth sampling and the other operating in a rotating azimuth plane scan mode (RAPS) for improved angular sampling.
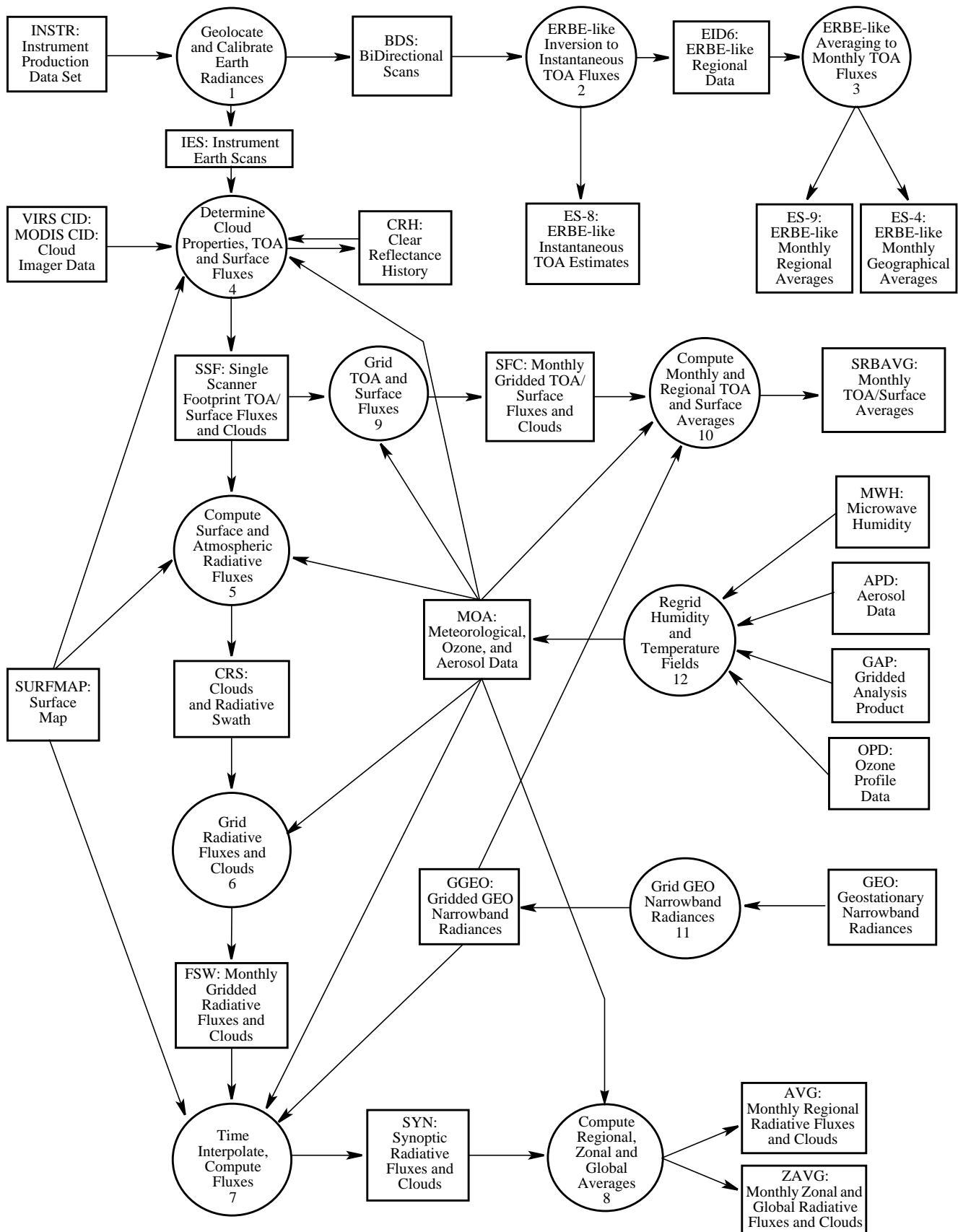
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Unit Definitions

Units	Definition
AU	Astronomical Unit, Astronomical Units
cm	centimeter, centimeters
count	count, counts
day	day, Julian date
deg	degree, degrees
deg sec^{-1}	degrees per second
DU	Dobson Unit
fraction	fraction 0..1
g kg^{-1}	grams per kilogram
g m^{-2}	grams per square meter
hhmmss	hour, minute, second
hour	hour, hours
hPa	hectoPascals
in-oz	inch-ounces
K	Kelvin
km	kilometer, kilometers
km sec^{-1}	kilometers per second
m	meter, meters
mA	milliamp, milliamps
micron	micrometer, micrometers, micron
msec	millisecond, milliseconds
mW cm^{-2}sr^{-1}µm^{-1}	milliWatts per square centimeter per steradian per micron
m sec^{-1}	meters per second
N/A	not applicable, none, unitless, dimensionless
percent	percent, percentage 0..100
rad	radian, radians
sec	second, seconds
volt	volt, volts
W h m^{-2}	Watt hours per square meter
W^2 m^{-4}	square Watts per meter to the 4th
W m^{-2}	Watts per square meter
W m^{-2}sr^{-1}	Watts per square meter per steradian
W m^{-2}sr^{-1}µm^{-1}	Watts per square meter per steradian per micron
°C	degrees centigrade
µm	micrometer, micrometers, micron, microns

APPENDIX A
Acronyms and Abbreviations

Appendix A
Acronyms and Abbreviations

ADM	Angular Distribution Model
APD	Aerosol Data
AVG	Monthly Regional Radiative Fluxes and Clouds
BDS	Bidirectional Scans
CADM	CERES Angular Distribution Model
CCSDS	Consultative Committee for Space Data Systems
CERES	Clouds and the Earth's Radiant Energy System
CID	Cloud Imager Data
CRH	Clear Reflectance History
CRS	Clouds and Radiative Swath
DAAC	Distributed Active Archive Center
DAO	Data Assimilation Office
DMS	Data Management System
EDDB	ERBE-Like Daily Database
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing (Ascending) Mission
EOS-PM	EOS Afternoon Crossing (Descending) Mission
EOSDIS	Earth Observing System Data and Information System
EP-TOMS	Earth Probe - Total Ozone Mapping Spectrometer
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
FOV	Field of View
FSW	Monthly Gridded Radiative Fluxes and Clouds
GAP	Gridded Analysis Product
GB	Giga Byte
GEO	Geostationary Narrowband Radiances
GGEO	Gridded GEO Narrowband Radiances
GHRC	Global Hydrology Research Center
GMS	Geostationary Meteorological Satellite
GMT	Greenwich Mean Time
GOES	Geostationary Operational Environmental Satellite
H	High
HDF	Hierarchical Data Format
IES	Instrument Earth Scans
IGBP	International Geosphere Biosphere Programme
IMS	Information Management System
INSTR	Instrument
ISCCP	International Satellite Cloud Climatology Project
IWC	Ice Water Content
IWP	Ice Water Path
LaRC	Langley Research Center
L	Low
LM	Lower Middle

LW	Longwave
LWC	Liquid Water Content
LWP	Liquid Water Path
MB	Mega Byte
METEOSAT	Meteorological Satellite
MOA	Meteorological, Ozone, and Aerosols
MODIS	Moderate Resolution Imaging Spectrometer
MWH	Microwave Humidity
NASA	National Aeronautics and Space Administration
NCEP	National Centers for Environmental Predictions
NOAA	National Oceanic and Atmospheric Administration
OPD	Ozone Profile Data
RAPS	Rotating Azimuth Plane Scan
SARB	Surface and Atmospheric Radiation Budget
SDS	Scientific Data Set
SFC	Monthly Gridded TOA/Surface Fluxes and Clouds
SMOBA	Stratospheric Monitoring Group Ozone Blended Analysis
SRB	Surface Radiation Budget
SRBAVG	Monthly TOA/Surface Averages
SSF	Single Scanner Footprint TOA/Surface Fluxes and Clouds
SSM/I	Special Sensor Microwave/Imager
SURFMAP	Surface Map
SW	Shortwave
SYN	Synoptic Radiative Fluxes and Clouds
TBD	To be determined
TISA	Time Interpolation and Spatial Averaging
TOA	Top of the Atmosphere, Top of Atmosphere
TOMS	Total Ozone Mapping Spectrometer
TRMM	Tropical Rainfall Measuring Mission
UM	Upper Middle
VIRS	Visible Infrared Scanner
WN	Window
Xtrt	Crosstrack
ZAVG	Monthly Zonal and Global Radiative Fluxes and Clouds